F16D

PATENT SPECIFICATION

DRAWINGS ATTACHED

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Int. Cl.:—F 16 d

COMPLETE SPECIFICATION

Overload Safety Claw Coupling

We, MASCHINENFABRIK AUGSBURG-NÜRNBERG A.G., a German company, of 7 Stadtbachstrasse, Augsburg, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by, the following statement:—

The invention relates to an overload safety claw coupling or clutch in which, in the event of overloading, one of the two halves is displaced axially in such a manner that the two coupling parts are completely separated from each other.

A large number of safety couplings are known which, in the event of overload separate the driving part from the driven part to prevent considerable damage. In addition to those, in which the separated parts in this condition rub one upon the other, couplings are also known which are completely separated from each other and are therefore no longer subjected to any wear.

There are also a number of friction-dependent or slip-dependent, electrically controlled couplings, as well as those in which claws, teeth, rollers or balls engage slots. In others again, spring-loaded roller levers or locking wheels or hydraulic devices are used. Almost all these couplings, however, have a positively rising force-distance-characteristic, that is to say, these couplings begin to operate on reaching the load limit, that is to say, an angularly true transmission is not possible with them.

In the case of certain drivers, such as, for example, in folding apparatus of printing machines, such couplings, however, should have no play in the peripheral direction, that is to say, they should not rotate relatively so long as the normal transmission torque is present. Furthermore, by means of such a coupling, the driven part should be prevented from continuing to run, in consequence of its rotating masses, when the machine is stopped.

These drawbacks of the known safety couplings may be avoided according to the invention by the fact that the slidable part of the coupling is supported by a number of springs distributed in pairs on the periphery in the manner of a toggle joint. As a result of this special design of the springs, the spring characteristic line is a falling one, that is to say, the coupling parts cannot move in the peripheral direction as long as the overload moment has not been exceeded and the coupling disengaged. The constructions of the two claw rows along the periphery with axis-parallel faces alternately with oblique faces in addition prevents undesired release of the coupling when the machine is braked.

A constructional example of the invention is represented in the accompanying drawings, wherein:

Figure 1 shows a longitudinal section,

Figure 2, a section on the line II—II of Figure 3, the upper and lower halves showing respectively the disengaged and engaged conditions of the coupling,

Figure 3, a section on the line III—III of Figure 1,

Figure 4, the partial development on the section IV—IV of Figure 1.

One claw part 3 is slidable on the driving shaft 1 along splines 2. The coupling part 4 of the driven side is arranged coaxially with aforesaid claw part. The power-transmitting surfaces of the two rows of claws 3, 4 are formed alternatively along the periphery as sloping faces 5, 6 which relatively turn on overload to axially move the clutch member 3 through the dead centre position of toggle springs (described below) which in turn throw the coupling part 3 completely clear of the coupling part 4 to disengage the coupling, and axis-parallel faces 7, 8.

[Price [redacted]

Between these two faces there are provided a nose 9 and on the other half a slot 10, by means of which the coupling can be engaged only in a definite peripheral position. Another depression 11 receives an eccentric 12, rotation of which permits manual operation of the coupling. The face 8 serves at the same time as counter-support for the face 6.

The coupling part 3 producing the closing force is provided with a plurality of springs 13, 14, distributed in pairs over over the periphery after the manner of a toggle joint, and fixed on the one hand to the pin 15, and on the other hand to pins 16, 17, which are mounted in a flange 18 of the coupling part. In Figure 2, in the lower half, the position of the spring pairs is shown in the engaged position, and in the upper half, in the disengaged position. The springs 13, 14 are arranged as stacks of cup springs between sleeves 19, 20, telescopically slidable one within the other. The spring power may be varied by rotation of the sleeves 19. The sleeves 19 are prevented from twisting by clips 21. As will be seen in Figure 2, pins 22 are screws in the sleeves 19, the pins 15, forming the joint for each spring pair, engaging eyes 23 of said pins 22.

By means of a so-called variable adjustment 24, it is possible, after loosening the screws 25, to adjust the driven shaft relatively to the driving shaft in the peripheral direction, that is to say, for example, to adjust the folding apparatus relatively to the printing mechanisms. By rotating the nuts 26 and 27, the position of the flange 18 can be varied and hence exact adjustment of the coupling in the axial direction can be obtained.

The claw part 3 is provided with a track 28, which on shifting of the coupling through the axial movement rocks a lever 29, which operates an end switch, not shown, whereby the machine is stopped.

WHAT WE CLAIM IS:—

1. Overload safety claw coupling having two halves coupled by spring force in which, in the event of overload, by means of co-operating oblique faces distributed on the periphery of both halves, one of the two coupling halves is displaced axially in such a manner that the two coupling halves are separated completely from each other, wherein the slidable part of the coupling is supported against axial movement by a plurality of springs, distributed in pairs on the periphery thereof after the manner of a toggle joint.

2. Overload safety claw coupling according to claim 1, wherein between the co-operating oblique faces distributed on the periphery of both halves are provided axis-parallel faces which, when the drive is stopped, prevent advancing of the driven part.

3. Overload safety claw coupling according to claims 1 and 2, wherein there are provided on one coupling part rectangularly projecting noses, which engage corresponding slots of the other part.

4. Overload safety claw coupling according to claims 1 and 2, wherein an eccentric is provided between the two coupling halves for the manual actuation of the coupling.

5. Overload safety claw coupling according to claim 1, wherein the slidable coupling part co-operates with an end switch for stopping the drive on overload disengagement.

6. Overload safety claw coupling according to claim 1, wherein the slidable coupling part is adjustably arranged in the axial direction.

7. Overload safety claw coupling according to claim 1, wherein the springs are constructed in the form of stacks of cup springs.

8. Overload safety claw coupling substantially as hereinbefore described with reference to the accompanying drawings.

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Fig.1

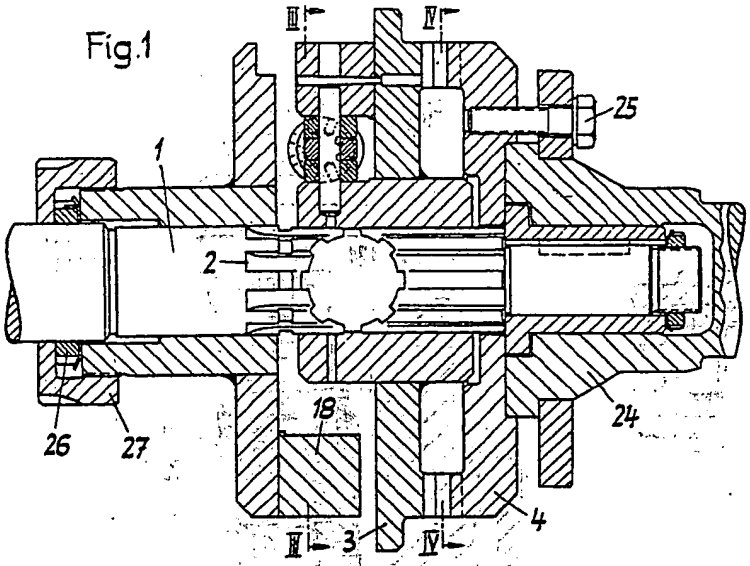
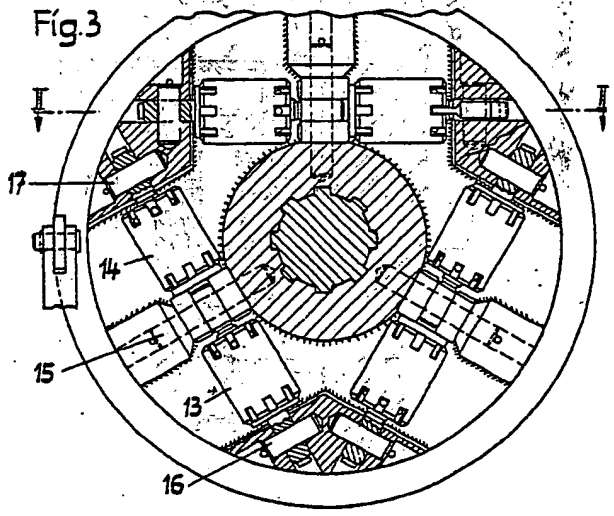


Fig.3



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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheets 1 & 2

Fig.2

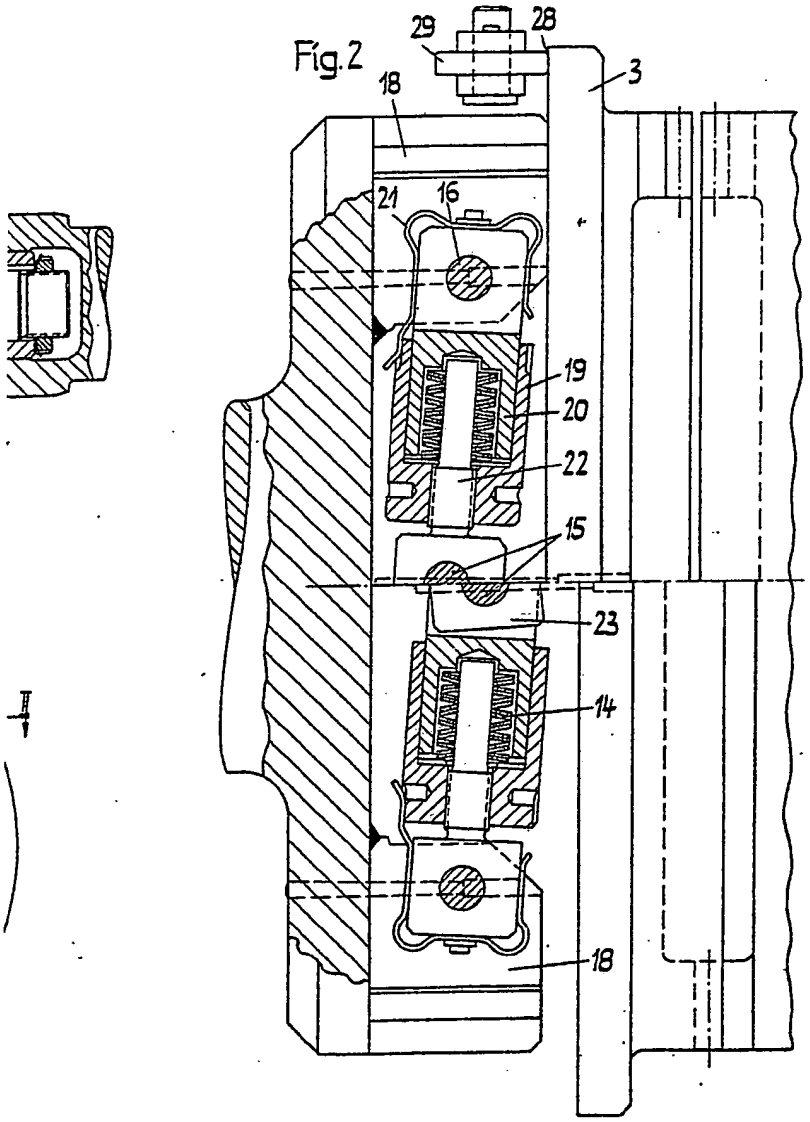

Fig.4

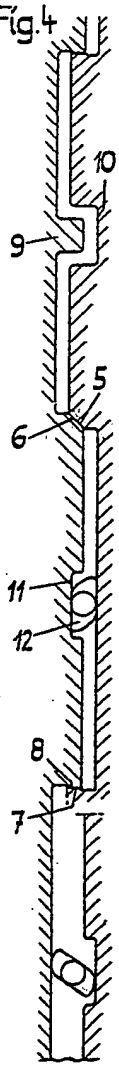

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Fig.1

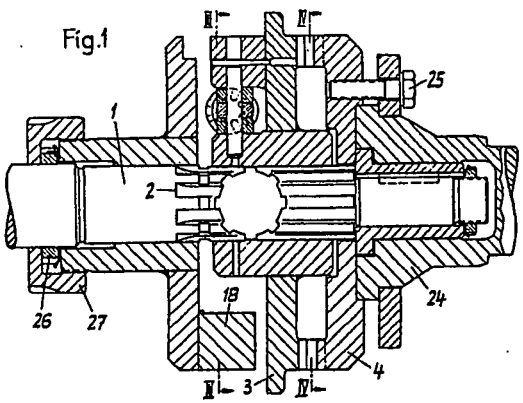

Fig.3

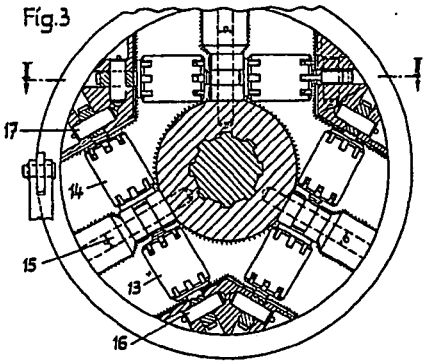

Fig.2

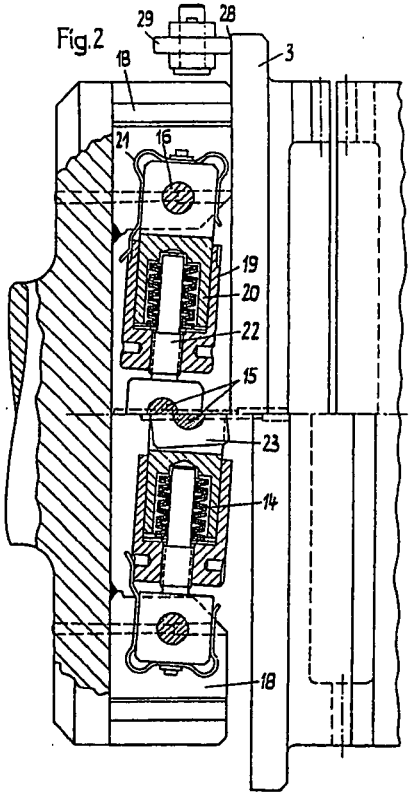

Fig.4